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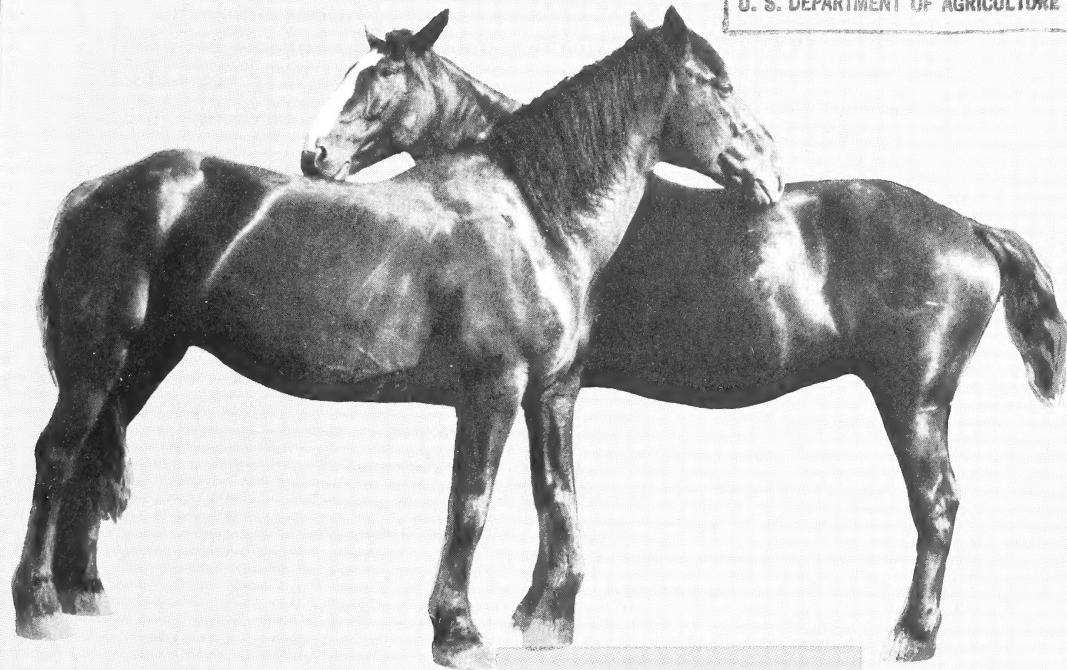
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HORSE BOTS

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U. S. DEPARTMENT OF AGRICULTURE



HOW
TO
CONTROL



THEM

Leaflet No. 450
U. S. DEPARTMENT OF AGRICULTURE

Replacement of horses and mules by tractors on farms in the United States has been a steady and impressive process. But the process has been by no means total—in 1958 there were about 3,348,000 of these animals on farms in this country.

In many areas, maintaining the health of draft animals continues to be an essential part of farm management. Because of this fact, there is a consistent demand for information about illnesses that affect horses and mules. A revival of interest in light horses has increased the demand.

Prevention and treatment of the disorders caused by horse bots are problems that concern thousands of horse owners. To meet the demand for information on control of horse bots, the U. S. Department of Agriculture publishes this bulletin.

**Prepared by
Entomology Research Division
Agricultural Research Service**

Washington, D.C.

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The Horse Bots and Their Control.**

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HORSE BOTS

How to Control Them

Three species of horse bot flies are serious pests in this country.

The common bot fly and the throat bot fly occur throughout the United States. The nose bot fly occurs in northwestern and midwestern States.

Bot flies can be controlled by treating infested animals to destroy larvae and eggs.

HOW BOT FLIES LIVE

Bot flies have four life stages—adult, egg, larva (bot), and pupa. The life stages are described on pages 4 and 5.

The adults (flies) do not feed. Their sole purpose in life is to reproduce. They live from a few days to 3 weeks.

In northern States, flies appear

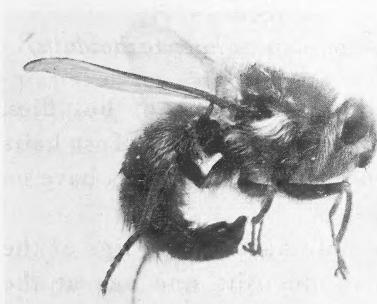
about the middle of June; they live until there is a heavy freeze. In southern States, they appear as early as March and may be seen until December.

Eggs usually can be found on horses as soon as flies are seen. Egg laying continues as long as adults are present. Eggs of the common bot fly that can hatch may be found on the animals as late as December in northern States, and as late as February in southern States.

During the larval stage, the bots develop inside the animal; they grow from minute size to about two-thirds inch in length. The exact nature of the food they take is not known, but they feed on body fluids.

Mature bots may be found in the digestive tracts of horses and other equines at any time of the year, but they usually pass out of the animals by October. Practically all the bots found in animals during the early part of the winter are young.

When fully developed bots pass out of the animal and reach the ground, they seek protection. They crawl very little. Usually they burrow into the ground near the place where they were dropped. They burrow only deep enough to escape the direct rays of the sun.



Adult female bot fly.

M & A 4267

THREE SPECIES OF BOT FLIES COMPARED

Common Bot Fly (*Gasterophilus intestinalis*)

Adult.—Largest of the three species; about the size of a honey bee. Body is covered with black and yellow hair. Wings are mottled.

Female hovers about animal; darts from place to place as she cements egg after egg to hairs on the forelegs (a favorite place), the mane, the shoulders, the belly, the neck, and the flanks. Fly takes but a second to attach each egg. Several eggs may be fastened to the same hair; many may be attached to the mane and flanks.

One female can lay 500 eggs.

Egg.—Yellow. Ready to hatch in about 7 days. Eggs hatch any time (within 2 or 3 months) the animal licks or bites itself at the spot where eggs are attached; heat from the animal's mouth stimulates hatching.

Larva.—Newly hatched larvae are taken into animal's mouth when it licks or bites itself. Larvae burrow into tongue. They continue to burrow for 3 to 4 weeks, then pass into the animal's stomach, attach themselves, and remain until mature. The total period for larval development is 10 to 11 months.

Mature larvae pass out of animal with feces.

Throat Bot Fly (*Gasterophilus nasalis*)

Adult.—Smaller than common bot fly and more rapid in flight. Wings have no markings.

Female poises in midair, usually near the animal's forelegs, then darts at the animal to attach eggs on hair under the jaws; cements 1 to 4 eggs to a hair during each attack; flies away after each attack; returns in a few minutes.

One female can lay 500 eggs.

Egg.—Yellowish. Hatches in about 6 days. Does not require moisture or friction for hatching.

Larva.—Newly hatched larvae crawl into animal's mouth. Usually they lodge in the pockets between the molars.

In 20 to 30 days larvae pass from the mouth into the stomach, then into the forward end of the small intestine, where they attach and remain until mature. The total period for larval development is 10 to 11 months.

Mature larvae pass out of animal with feces.

Nose Bot Fly (*Gasterophilus haemorrhoidalis*)

Adult.—Smallest of bot flies; most rapid in flight. Most hairs on body are dark. Wings have no markings.

Female darts at the lips of the animal; deposits one egg at the base of the hair, then darts away. A few seconds later she strikes

again. Eggs are deposited close to the skin, usually along the front of the upper and lower lips.

One female can lay 160 eggs.

Egg.—Black. Hatches in about 2 days. Moisture is necessary for hatching, but apparently friction is not required.

Larva.—Newly hatched larvae burrow through the lips to the inside of the lips just in front of the teeth. Here they remain for 6 weeks or more.

Larvae then pass to various parts of the stomach, and attach to the lining. The greatest number attach near the stomach exit.

Mature larvae release their attachment in the stomach, pass to the rectum, and attach again. They remain here 2 or 3 days, then release their attachment and drop to the ground. The total period for larval development is similar to that for the other two species.

Pupa.—Similar for all three species. The pupal stage begins 1 to 4 days after the bots burrow into the ground. The outer skin of the larva hardens to form a protective coating—the pupal case; this case is brown or black. Within the pupal case the bot changes into a fly. At the end of the pupal period, which ranges from 15 to 70 days, the fly emerges from the pupal case and mates. Another life cycle begins.

DAMAGE

Horse bot flies damage animals indirectly and directly.

Indirect damage is that which infested animals do to themselves or to human beings. It may result from fright and annoyance caused by egg-laying adults; it may result from irritation caused by newly hatched bots.

Direct damage is produced by larvae feeding on the tissues of the animal.

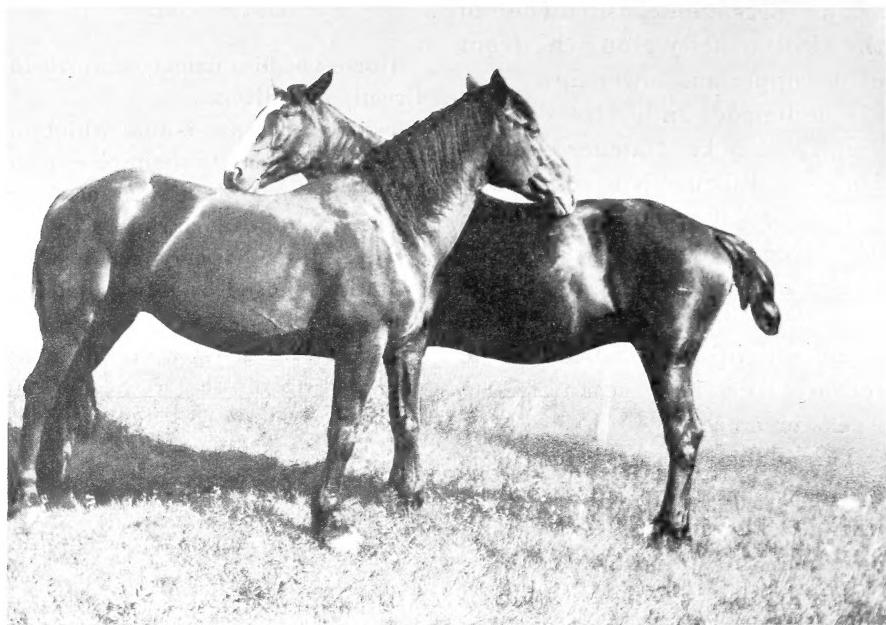
Indirect Damage

By FLIES.—Animals fear the flies and are annoyed by them. The common bot fly is the least annoying of the three species, probably because it does not fly toward the animal's head as do the throat and nose bot flies.

On warm, sunny days, when bot flies are most numerous, horses and mules on pasture fight the flies from morning until late afternoon. They walk about trying to get rid of the flies, constantly bobbing their heads as they walk. If this fails to prevent attack, they run. They may gather in the shade on high ground when the wind blows, or they may enter barns or other shelters. Colts, which are heavily attacked, may lie down near the older animals.

While the horses are fighting the flies, they are unable to graze; after days of bot fly attack, they may lose weight and suffer from lack of proper nourishment.

Men who go near horses being attacked by flies may be injured severely. Horses attacked in harness or when saddled often become un-



M & A 4508

Horses protecting their lips from nose bot flies.

controllable. Runaways commonly result.

BY LARVAE.—Newly hatched bots produce a severe irritation as they burrow into the animal's tongue, gums, or lips. The irritation and itching caused by the young nose bots is particularly severe.

To relieve the irritation, animals may stand at watering troughs, dip their lips into water, and rub their lips violently against the wall of the tank. They may injure themselves by rubbing their lips and noses on the ground, fences, stones, or other objects.

Direct Damage

The bots attach themselves with spiny mouth hooks to the lining of the animal's stomach or small intes-

tine. These attachments cause inflammation, which interferes with digestion.

Bots attached to the lower part of the stomach interfere with the passage of food. Infested animals often suffer from colic or other gastric disturbances.

The degree of damage done by the feeding of the larvae is roughly in proportion to the number present. Several hundred larvae may be found in one animal; more than 1,000 have been found in the stomach of a colt.

CONTROL

Treat animals in the fall to rid them of eggs and larvae. The animals will be in better health throughout the winter, and there will be

fewer bot flies to annoy them the following summer.

Two kinds of treatment are needed—external and internal. The external treatment may be given by the owner to rid the animal of the eggs of the common bot fly. The internal treatment should be given by a veterinarian about a month later to rid the animal of the larvae of any of the three species.

External Treatment

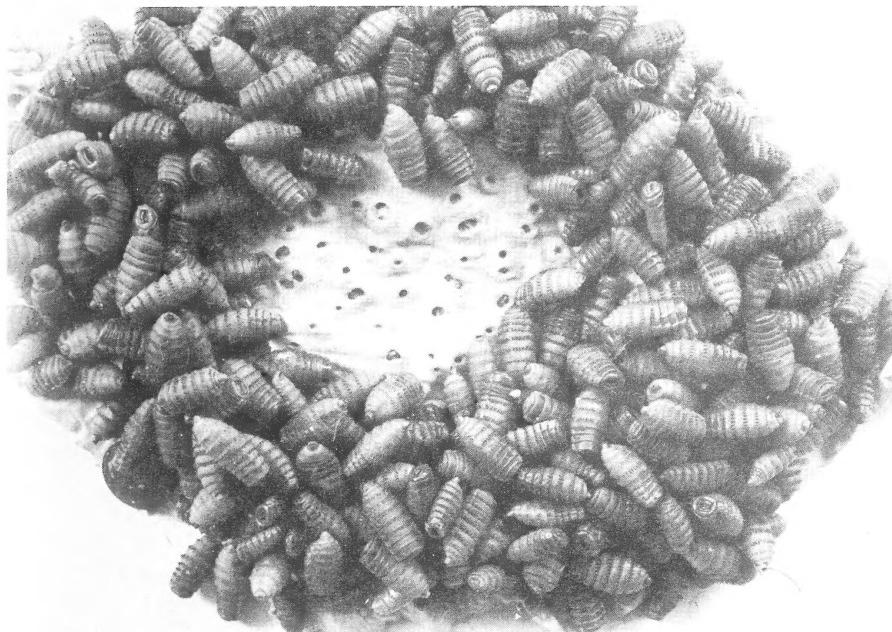
This treatment consists of applying warm water to the animal to hatch the eggs of the common bot fly. The best time to give the treatment is about 30 days after the first frost, when adult bot flies have dis-

peared—about November in the North and December in the South.

By this time most of the eggs of the throat and nose bot flies will have hatched, and most of their larvae will have passed to the stomach. The animal may still harbor many eggs of the common bot fly, and larvae may be in the tongue. Unless these eggs are destroyed and 30 days are allowed for larvae in the tongue to pass to the stomach, heavy infestations may develop even after the larvae are killed in the internal treatment.

The treatment for destroying common bot fly eggs:

- Heat water to between 115° and 120° F. If you have no thermome-



Part of horse's stomach heavily infested with bots. Note the lesions that these bots have caused.

M & A 4283

ter, test the water with your hand. It should be heated just to the point at which you can keep your hand immersed without discomfort.

- Wet a sponge or cloth thoroughly with the water and rub it firmly over the animal's body where eggs of the common bot fly are seen.

The firm rubbing is necessary to impart heat and moisture quickly in order to hatch the eggs. The newly hatched bots will die soon after they hatch.

Internal Treatment

This treatment consists of putting carbon disulfide directly into the stomach of the animal. The chemical acts as a fumigant; it poisons the bots, causing them to release their hold on the walls of the stomach and intestines. If administered improperly, this chemical can kill the animal.

To be most effective, carbon disulfide should be given 1 month after the hot-water treatment. During the month between treatments, the bots that were burrowing in the mouth at the time of the warm-water bath will have reached the stomach or the intestines, where the carbon disulfide is effective.

Steps in obtaining and administering the treatment are:

- Early in the fall, make an appointment with a veterinarian to have

your animals treated on the desired date.

- Fast the animals for 18 hours before they are to be treated.
- The veterinarian administers carbon disulfide by stomach tube, or he inserts carbon disulfide in gelatin tablets into the animal's stomach with a balling gun. A horse weighing about 1,000 pounds is given 6 drams of the chemical. Smaller animals are given less. Yearling colts should not receive over 3 drams.
- Do not feed or water the animal for 3 hours after the administration of carbon disulfide.

COMMUNITY CONTROL PROGRAMS

A number of communities have attempted bot control by a systematic treatment of all donkeys, mules, horses, and colts. In only 1 year such treatment has greatly decreased the annoyance from bot flies and has improved the health of the animals.

It appears possible to achieve a high degree of control of bot flies by 2 or 3 years of systematic community effort. Animals should be treated both with hot-water washes and with carbon disulfide.

To arrange for a community control program, consult your county agent, farm advisor, or veterinarian.



